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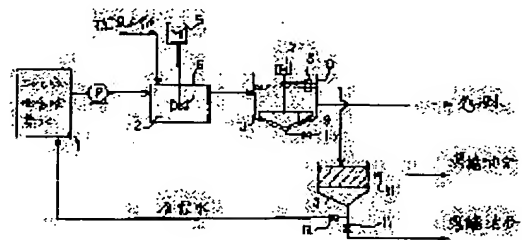
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## (54) WASTE WATER TREATMENT FOR EMULSIVE OILY WASTE WATER BY OIL-WATER SEPARATION

## (57)Abstract:

PURPOSE: To easily treat an oil content hard to remove with a small-sized and simple treating device by adding a demulsifier to emulsive oily waste water to agitate them before performing oil-water separation to separate the waste water into a water layer as treated water and an oil content as that of high concentration in a floating concentration tank which are removed.

CONSTITUTION: On the downstream side of an emulsive oily waste water storage tank 1, a reactor tank 2 where the emulsive oily waste water and a demulsifier whose quantity is equal to or more than that of an emulsifier included in it are mixed by agitation to destruct the emulsion, an oil-water separation tank 3 where the waste water whose emulsion has been destructed is objected to oil-water separation and a floating concentration tank 4 for concentrating the separated oil content are arranged in order. An agitating blade 6 is arranged in the reactor tank 2 and a floated oil content scraper 8 and a deposit scraper 9 are installed in the oil-water separation tank 3 to collect the floated oil content in an oil content receiver 10. In the floating concentration tank 4, withdrawal pipes 11 for withdrawing the concentrated oil content are arranged in the intermediate layer of and below it and simultaneously the separated water by concentration is eliminated by a drain pipe 12.



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CLAIMS

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[Claim(s)]

[Claim 1] It is the waste-water-treatment method by oily water separation of the emulsion nature oily waste water characterized by carrying out addition stirring of the emulsifier contained in an emulsion nature oily waste water at it, and the demulsifier more than an equivalent amount, destroying an emulsion, performing oily water separation after that, and making a water layer into a treated water, and leading oil impregnation sludge to a surfacing thickener tank, and carrying out separation removal as a high-concentration oil content.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the method of processing the waste water which the oil content emulsion-ized with surfactants discharged in large quantities from for example, automobile works, such as a water soluble cutting oil.

[0002]

[Description of the Prior Art] Use of a water-soluble cutting fluid prospers increasingly with improvement in the speed of machining. and as conventional technology, there are coagulation sedimentation and a dissolved air flotation method -- since a waste underwater oil content is high concentration, acidolysis is carried out and these oily waste waters are processed after the floatation of an oil content

[0003] In these arts, since the water content of oily sludge is high, dehydration processing is carried out further and it streamlines in many cases. Furthermore, in these conventional method, an initial cost serves as size again.

[0004] Moreover, on the other hand, only by these arts, a lot of CODs remain, and other arts are needed for the latter part, and have the method which processing incinerates directly from a bird clapper intricately. However, since a lot of moisture must be evaporated in this case, a running cost serves as size.

[0005]

[Problem(s) to be Solved by the Invention] this invention uses as an offer plug the waste-water-treatment method which simplified processing, made the initial cost small and made unnecessary a high running cost like [ again ] incineration by being made in view of the above-mentioned point, destroying an emulsion by the demulsifier and making as [ perform / oily water separation / a specific gravity difference / after that ].

[0006]

[Means for Solving the Problem] The place which it \*\* and is made into the summary of this invention carries out addition stirring of the emulsifier contained in an emulsion nature oily waste water at it, and the demulsifier more than an equivalent amount, an emulsion is destroyed, oily water separation is performed after that, and a water layer is made into a treated water, and oil impregnation sludge is led to a surfacing thickener tank, and it is in the waste-water-treatment method by oily water separation of the emulsion nature oily waste water characterized by carrying out separation removal as a high-concentration oil content. In addition, the matter which carries out work equivalent to a surfactant and this is called aforementioned demulsifier.

[0007] If a demulsifier is made to act on an emulsion nature oily waste water as mentioned above, a reaction advances to creaming -> condensation -> coalescence, and waste underwater colloid loses a charge and carries out condensation surfacing, and further, by the surfacing tub, coalescence will progress and it will be condensed as an oil reservoir.

[0008]

[Example] The example of this invention is explained based on an accompanying drawing below. Drawing 1 is the outline block diagram of the equipment for enforcing the waste-water-treatment method concerning this invention.

[0009] This equipment arranges the reaction vessel 2 which carries out stirring mixture of an emulsion nature oily waste water and the demulsifier (it is a cationic surfactant when for example, an emulsion nature oily waste water is an anion), and destroys an emulsion to the downstream of the emulsion nature oily-waste-water depot 1, the oily water separation tub 3 which carries out oily water separation of the waste water which had the emulsion destroyed, and the surfacing thickener tank 4 which condenses the oil content by which oily water separation was carried out one by one. In addition, the aforementioned cationic surfactant will call a cationic surfactant the matter which works as a cationic surfactant, if an amine and the 4th ammonium neutralize from an acid. Moreover, although an anionic surfactant is used when an emulsion nature oily waste water is a cation, this anionic surfactant will call an anionic surfactant the matter which works as an anionic surfactant, if it neutralizes by the base. In addition, the example of a demulsifier is shown in Table 1.

[Table 1]

会社名	商品名	組 成
花王 (株)	コータミン60w	セチルトリメチルアンモニウムクロライド
"	コータミン86w	ステアリルトリメチルアンモニウムクロライド
"	ファーミンDMC	ジメチルココナットアミン
"	ファーミンT	午脂アミン

[0010] moreover, the impeller 6 made to rotate by the motor 5 is arranged, and it rakes up to the aforementioned reaction vessel 2 by the floated oil made to rotate by the motor 7 by the oily water separation tub 3, and an opportunity 8 and the settlings \*\*\*\*\* machine 9 prepare in it — having — an oil content — it is made as [ collect / parts for floated oil / by the receiver tank 10 ] moreover — the surfacing thickener tank 4 — concentration — while the drawn tube 11 which draws out an oil content is arranged at a middle lamella and the lower part, it is made as [ eliminate / the sejunction water separated by concentration / with a drain pipe 12 ]

[0011] Moreover, the example of an experiment of this invention is shown below.

[The example 1 of an experiment]

Raw water Automobile works water-soluble-cutting-oil waste water quantity of water to be treated 10 l / 1-hour reaction vessel 2.5 l flotation cell 15 l thickener tank 30 l floated oil part concentration time 24-hour demulsifier KAO Kohtamin 60w (tradename) Rate of addition 1.5 kg-DS/m<sup>3</sup> [0012] The result of the experiment conducted in the aforementioned conditions was shown in Table 2.

[Table 2]

	原 水	処理水	濃縮油分
pH	8.1	7.9	——
ノルマルヘキサン抽出物質	4600mg/l	400mg/l	24 %
B O D	13000mg/l	8000mg/l	——
T O C	12000mg/l	6000mg/l	——
T S	——	——	32 %
V T S	——	——	97 %

[0013] [The example 2 of an experiment]

Raw water Metalworking works water-soluble-cutting-oil waste water quantity of water to be treated 10 l / 1-hour reaction vessel 2.5 l

Rotation cell 15-l thickener tank 30 l floated oil part concentration time 24-hour demulsifier FAMIN DMC(tradename)+ hydrochloric acid  
 Rate of addition 1.5 kg-DS/m<sup>3</sup> [0014] The result of the experiment conducted in the aforementioned conditions was shown in Table 3.  
 [Table 3]

	原 水	処理水	濃縮油分
pH	7.3	7.2	——
ノルマルヘキ サン抽出物質	8500mg/l	460mg/l	38 %
B O D	18000mg/l	11000mg/l	——
T O C	15000mg/l	9800mg/l	——
T S	——	——	41 %
V T S	——	——	98 %

[0015]

[Effect of the Invention] Since an emulsion is destroyed by the demulsifier and oily water separation is carried out according to a specific gravity difference in this invention like the above, for this reason, it can consider as what [ very / in equipment / small and / easy ], and a reaction vessel (line pouring is included), an oily water separation tub, and a surfacing thickener tank can make an initial cost small what is necessary be just to be. Moreover, processing is very easy in order that an oil content may carry out natural concentration as a liquid in a surfacing thickener tank at high concentration. Moreover, for the reason, a high running cost is not needed like incineration.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is rough explanatory drawing of the equipment for enforcing the waste-water-treatment method concerning this invention.

[Description of Notations]

1 Oily-Waste-Water Depot

2 Reaction Vessel

3 Oily Water Separation Tub

4 Surfacing Thickener Tank

5 Motor

6 Impeller

7 Motor

8 Rake Up by Floated Oil and it is Opportunity.

9 Settling Machine

10 Oil Content — Receiver Tank

11 Drawn Tube

12 Drain Pipe

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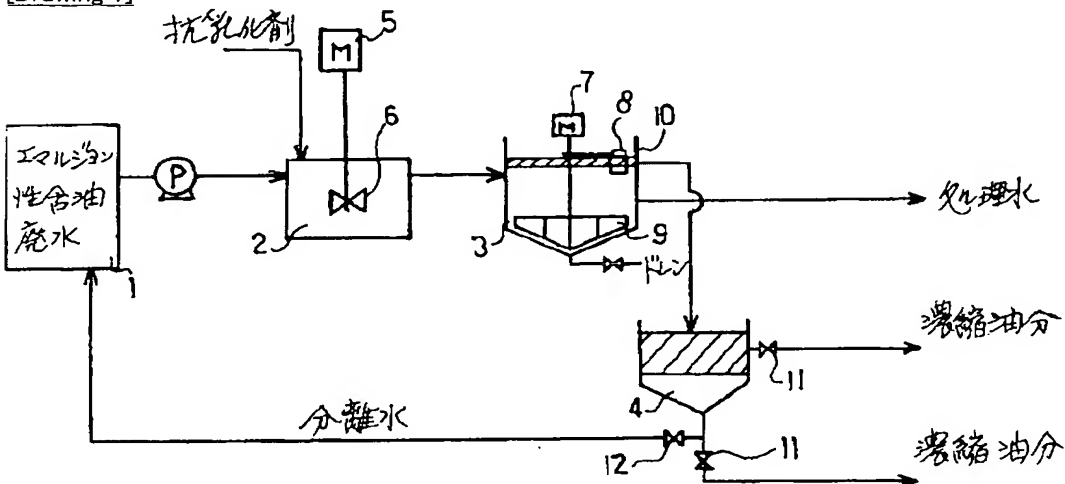
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## DRAWINGS

[Drawing 1]



[Translation done.]

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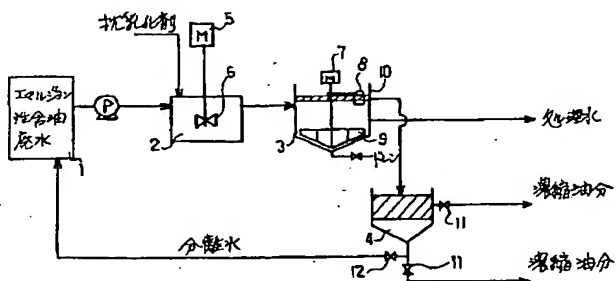
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(54)【発明の名称】 エマルジョン性含油廃水の油水分離による廃水処理方法

(57)【要約】

【構成】 エマルジョン性含油廃水に、それに含まれる乳化剤と同等量以上の抗乳化剤を加えて攪拌する。その後油水分離を行い、水層は処理水とし、油分は浮上濃縮槽に導き、高濃度の油分として分離除去する。

【効果】 処理設備の規模を小型にし且つ簡単なものにすることができる。また高濃度の乳化された除去困難な形の油分を、簡素で簡便に処理することができる。





## 【特許請求の範囲】

【請求項1】 エマルジョン性含油廃水に、それに含まれる乳化剤と同等量以上の抗乳化剤を添加攪拌してエマルジョンを破壊し、その後油水分離を行い、水層は処理水とし、また含油汚泥は浮上濃縮槽に導き、高濃度の油分として分離除去することを特徴とするエマルジョン性含油廃水の油水分離による廃水処理方法。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、例えば自動車工場から大量に排出される、水溶性切削油等の界面活性剤により油分がエマルジョン化した廃水処理する方法に関する。

## 【0002】

【従来の技術】 機械加工の高速化に伴い、水溶性切削剤の使用は益々盛んになってきている。そして、従来技術としては、凝集沈澱・加圧浮上法があるが、廃水中の油分が高濃度であるため、酸分解して油分の浮上分離後にこれら含油廃水の処理を行う。

【0003】 これらの処理方法においては、油性の汚泥の含水率が高いため、更に脱水処理して減量化する場合が多い。更にまたこれら従来方法においては、インシヤルコストが大となる。

【0004】 また一方、これらの処理方法だけでは大量のCODが残存し、他の処理方法も後段に必要となり、処理が複雑になることから、直接焼却する方法がある。しかし、この場合には大量の水分を蒸発させなければならないため、ランニングコストが大となる。

## 【0005】

【発明が解決しようとする課題】 本発明は上記の点に鑑みなされたものであって、抗乳化剤によりエマルジョンを破壊し、その後比重差により油水分離を行うようになすことにより、処理を簡略化してインシヤルコストを小さくし且つまた焼却のような高いランニングコストを不要とした廃水処理方法を提供せんとするものである。

## 【0006】

【課題を解決するための手段】 而して、本発明の要旨とするところは、エマルジョン性含油廃水に、それに含まれる乳化剤と同等量以上の抗乳化剤を添加攪拌してエマルジョンを破壊し、その後油水分離を行い、水層は処理水とし、また含油汚泥は浮上濃縮槽に導き、高濃度の油分として分離除去することを特徴とするエマルジョン性含油廃水の油水分離による廃水処理方法にある。尚、前記抗乳化剤とは、界面活性剤およびこれと同等の働きをする物質をいう。

【0007】 前記のようにエマルジョン性含油廃水に抗乳化剤を作用させると、クリーミング→凝集→合一へと反応が進行し、そして廃水中のコロイドが電荷を失って凝集浮上し、更に浮上槽で合一が進み、油層として濃縮されるものである。

## 【0008】

【実施例】 以下に本発明の実施例を添付図面に基づいて説明する。図1は本発明に係る廃水処理方法を実施するための装置の概略構成図である。

【0009】 この装置は、エマルジョン性含油廃水貯留槽1の下流側に、エマルジョン性含油廃水と抗乳化剤（例えば、エマルジョン性含油廃水が陰イオンである場合には陽イオン界面活性剤）を攪拌混合してエマルジョンを破壊する反応槽2と、エマルジョンを破壊された廃水を油水分離する油水分離槽3と、油水分離された油分を濃縮する浮上濃縮槽4とを順次配置している。尚、前記陽イオン界面活性剤とは、陽イオン界面活性剤と、アミン、第4アンモニウムで酸で中和すると陽イオン界面活性剤として働く物質をいう。また、エマルジョン性含油廃水が陽イオンである場合には陰イオン界面活性剤を用いるが、この陰イオン界面活性剤とは、陰イオン界面活性剤と、塩基で中和すると陰イオン界面活性剤として働く物質をいう。尚、抗乳化剤の例を表1に示す。

## 【表1】

会社名	商品名	組 成
花王(株)	コータミン60w	セチルトリメチルアンモニウムクロライド
"	コータミン86w	ステアリルトリメチルアンモニウムクロライド
"	ファーミンDMC	ジメチルココナットアミン
"	ファーミンT	午脂アミン

【0010】また、前記反応槽2には、モータ5で回転せしめられる攪拌羽根6が配置され、また油水分離槽3には、モータ7で回転せしめられる浮上油分掻寄せ機8と、沈澱物掻寄せ機9とが設けられ、油分受槽10にて浮上油分を収集するようになされている。また、浮上濃縮槽4には、濃縮油分を引き抜く引抜管11が中層及び下部に配置されると共に濃縮により分離された分離水をドレン管12にて排除するようになされている。

【0011】また、以下に本発明の実験例を示す。

〔実験例1〕

原水 自動車工場水溶性切削油廃水

処理水量 10 l / 1時間

反応槽 2.5 l

20 浮上分離槽 15 l

濃縮槽 30 l

浮上油分濃縮時間 24時間

抗乳化剤 KAOコータミン60w (商品名) 添加率 1.5 Kg・DS/m<sup>3</sup>

【0012】前記の条件において行った実験の結果を表2に示した。

【表2】

	原 水	処理水	濃縮油分
pH	8.1	7.9	——
ノルマルヘキ サン抽出物質	4600mg/l	400mg/l	24 %
B O D	13000mg/l	8000mg/l	——
T O C	12000mg/l	6000mg/l	——
T S	——	——	32 %
V T S	——	——	97 %

## 【0013】〔実験例2〕

原水 金属加工工場水溶性切削油廃水  
 処理水量 10 l / 1時間  
 反応槽 2.5 l  
 浮上分離槽 15 l  
 濃縮槽 30 l

浮上油分濃縮時間 24時間

抗乳化剤 フェーミンDMC (商品名) + 塩酸 添加  
 率 1.5 Kg・DS/m<sup>3</sup>

【0014】前記の条件において行った実験の結果を表3に示した。

【表3】

	原 水	処理水	濃縮油分
pH	7.3	7.2	——
ノルマルヘキ サン抽出物質	8500mg/l	460mg/l	38 %
B O D	18000mg/l	11000mg/l	——
T O C	15000mg/l	9800mg/l	——
T S	——	——	41 %
V T S	——	——	98 %

## 【0015】

【発明の効果】上記の如く、本発明においては、抗乳化剤によりエマルジョンを破壊し、比重差により油水分離するものであるから、反応槽（ライン注入を含む）と油水分離槽と浮上濃縮槽とがあれば良く、このため装置的にきわめて小型で且つ簡単なものとすることができ、イニシャルコストを小さくすることができる。また、浮上濃縮槽において油分が高濃度に液体として自然濃縮するため、処理がきわめて簡単である。また、そのため焼却のように高いランニングコストを必要としないものである。

## 【図面の簡単な説明】

【図1】本発明に係る廃水処理方法を実施するための装置の概略的説明図である。

## 【符号の説明】

- 1 含油廃水貯留槽
- 2 反応槽
- 3 油水分離槽
- 4 浮上濃縮槽
- 5 モータ
- 6 攪拌羽根
- 7 モータ
- 8 浮上油分掻寄せ機
- 9 沈澱物掻寄せ機
- 10 油分受槽
- 11 引抜管
- 12 ドレン管

【図1】

